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(12) **United States Patent**  
**Itou**(10) **Patent No.:** **US 9,284,280 B2**  
(45) **Date of Patent:** **Mar. 15, 2016**(54) **USE OF FORM-I CRYSTAL OF 2-{4-[N-(5,6-DIPHENYLPYRAZIN-2-YL)-N-ISOPROPYL-AMINO]BUTYLOXY}-N-(METHYL-SULFONYL)ACETAMIDE**(71) Applicant: **Hideyuki Itou**, Kyoto (JP)(72) Inventor: **Hideyuki Itou**, Kyoto (JP)(73) Assignee: **NIPPON SHINYAKU CO., LTD.**,  
Kyoto (JP)(\*) Notice: Subject to any disclaimer, the term of this  
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**A61K 31/4965** (2006.01)(52) **U.S. Cl.**CPC ..... **C07D 241/20** (2013.01); **A61K 31/4965**  
(2013.01); **C07B 2200/13** (2013.01)(58) **Field of Classification Search**CPC ..... C07D 233/60; C07D 241/20  
See application file for complete search history.(56) **References Cited****U.S. PATENT DOCUMENTS**8,394,793 B2 3/2013 Kyo  
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*Primary Examiner* — Michael Barker*Assistant Examiner* — Karen Cheng(57) **ABSTRACT**A method is provided in which Form-I crystal of 2-{4-[N-(5,  
6-diphenylpyrazin-2-yl)-N-isopropylamino]butyloxy}-N-  
(methylsulfonyl)acetamide is administered as an active ingre-  
dient to a subject for the purpose of treating or preventing  
certain diseases, disorders, and symptoms, or for promoting  
angiogenesis or gene therapy. The Form-I crystal exhibits  
diffraction peaks in its X-ray powder diffraction spectrum at  
least at the following angles of diffraction 2θ when the spec-  
trum is obtained by using Cu Kα radiation: 9.4 degrees, 9.8  
degrees, 17.2 degrees, and 19.4 degrees. The targeted dis-  
eases and disorders include transient ischemic attack, dia-  
betic neuropathy, diabetic gangrene, peripheral circulatory  
disturbance, connective tissue disease, reocclusion/restenosis  
after percutaneous transluminal coronary angioplasty, arte-  
riosclerosis, thrombosis, hypertension, pulmonary hyperten-  
sion, ischemic disorder, angina, glomerulonephritis, diabetic  
nephropathy, chronic renal failure, allergy, bronchial asthma,  
ulcer, pressure ulcer (bedsore), restenosis after coronary  
intervention, thrombocytopenia by dialysis, the diseases in  
which fibrosis of organs or tissues is involved, erectile dys-  
function, inflammatory bowel disease, and gastritis.**9 Claims, 6 Drawing Sheets**